LASER TREATMENT OF URINARY INCONTINENCE IN WOMEN

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Background and Objective

Many women suffer from various types and grades of urinary incontinence (UI), especially stress urinary incontinence (SUI), which appears during coughing, sneezing, or physical exertion. Although there are already many therapies for SUI, from conservative ones like Kegel exercises and electro or magnetic stimulation of pelvic floor muscles to various surgical solutions like TOT and TVT, there is still a need for non-surgical but effective therapy. Lately, a novel laser therapy based on thermal effects on vaginal mucosa appeared on the market, and the goal of this study was to do a clinical evaluation of this newly proposed therapy.

Methods

Patients with diagnosed stress and mixed urinary incontinence (MUI) were treated with a new Er:YAG laser treatment. Prior to treatment, all patients were clinically inspected and classified by incontinence types and grades using ICIQ-UI and the Incontinence Severity Index (ISI) according to the Klovning study [1]. Additional assessment tools included perineometric measurements and post-void residual urine volume measurements, used as secondary measures. Patients received one or two treatment sessions with an interval of 2 months in between the sessions. An Er:YAG laser (SP Spectro, Fotona, Slovenia) with wavelength of 2940 nm was used in a special non-ablative SMOOTH mode [2], according to the manufacturer's protocol [3]. Treatment discomfort was measured at every session with an 11-point numerical pain scale. Patients were also asked to assess the result of the treatment on a 5-grade improvement scale (no change, mild, moderate, significant and excellent (healed) improvement). Follow-ups with repeated measurements were performed at 2 and 6 months.

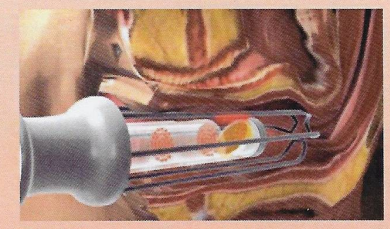


Figure 1. Laser treatment of urinary incontinence

grade	ICIQ-UI score (without QoL)	
0	0	no UI
1	1-3	mild
2	4-5	moderate
3	6-9	severe
4	10-11	very severe

Figure 2. Grades of UI from ICIQ-UI

Results

During the 12-month period 107 patients (average age 50.1 years, average BMI of 24.4 and parity of 2.0) were treated with the Er:YAG laser. Of all patients, 67 (62.6%) were diagnosed with SUI and 40 (37.4%) MUI. The average ISI score before the treatment was 5.7 points (moderate, almost severe UI), and at follow-ups at 2 and 6 months after the treatment, 1.0 point (very mild UI). Most of the patients (50 or 46.7%) had severe UI, 30 (or 28.0%) moderate, 19 (17.8%) mild and 8 (7.5%) very severe UI before the treatment. At 6-month follow-ups, a large majority of patients (96.3%) reported a decrease of their UI severity grades. Only 4 of them remained with the same severity grade, but even in these patients ISI scores were lower. Treatment discomfort was very low (average grade 0.6 on a 10-point scale) and a large majority of patients (92.5%) assessed their improvement as significant or excellent (healed). There were no adverse effects of this treatment reported.

Patients Characteristics	N=107
Demographics and History:	
Age, mean (range), y	50,1 (22-77)
Parity, mean (range)	2,0 (0-4)
BMI, mean (range)	24,4 (17,4 - 35,1)
Type of Incontinence:	
Stress UI	67 (62,6%)
Mixed UI	40 (37,4%)
Severity of Incontinence:	
Mild	19 (17,8%)
Moderate	30 (28,0%)
Severe	50 (46,7%)
Very Severe	8 (7,5%)

Table 1. Patient demographics and baseline characteristics

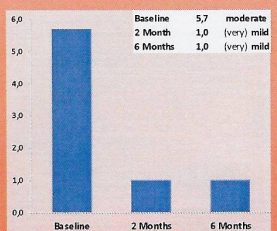
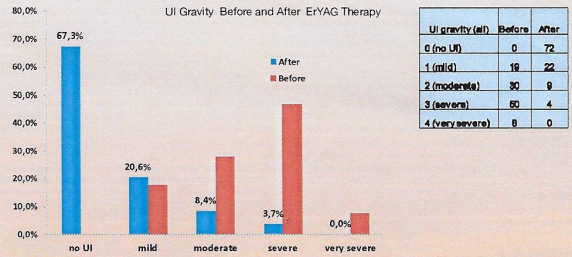


Figure 3. Average UI grades before and after laser treatment



UI gravity (all)	Before	After
0 (no UI)	0	72
1 (mild)	19	22
2 (moderate)	30	9
3 (severe)	50	4
4 (very severe)	8	0

Figure 4. UI severity change in all patients (stress UI and mixed UI) from baseline to 6 months after the treatment. 72 patients (67.3%) were without UI at 6 months, while 22 (20.6%) remained with mild UI, 9 patients (8.7%) with moderate and only 4 patients (3.7%) with severe UI.

SUI gravity	Before	After
0 (no UI)	0	51
1 (mild)	17	10
2 (moderate)	17	6
3 (severe)	30	0
4 (very severe)	3	0

MUI gravity	Before	After
0 (no UI)	0	21
1 (mild)	2	12
2 (moderate)	13	3
3 (severe)	20	4
4 (very severe)	5	0

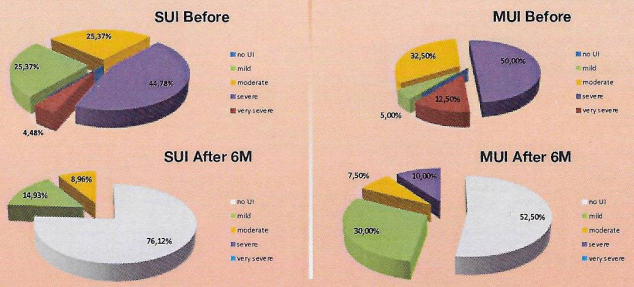


Figure 5. UI severity change in patients with Stress UI and Mixed UI. In Stress UI patients, the population results were even better: 51 patients (76.1%) became dry, 10 (14.9%) remained with mild and 6 patients (9%) with moderate UI, while there were no patients remaining with severe and very severe UI (before the treatment there were 33 such patients). In Mixed UI, 21 patients (52.5%) became dry, 12 (30%) remained with mild, 3 (7.5%) with moderate and only 4 patients (10%) with severe UI. Before the treatment there were 25 patients in the severe and very severe category.

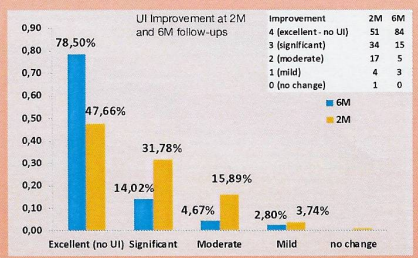


Figure 6. Patients' assessment of the improvement of their UI: 92.5% of all patients assessed the improvement of their UI at 6 months after the Er:YAG laser treatment as excellent (78.5% healed) or significant. All patients (100%) said they improved at 6 months after the therapy.

Conclusions

This clinical evaluation of a new non-invasive Er:YAG laser treatment for stress and mixed urinary incontinence showed high efficacy in improvement of UI with no adverse effects noted. Patients' discomfort during the treatment was minimal and satisfaction very high. For evaluation of the duration of the treatment effects, longer follow-ups are necessary and we are looking forward to seeing our patients at 12 and 24 months post-op.

References

1. Klovning A, Avery K, Sandvik H, Hunskaar S. Comparison of two questionnaires for assessing the severity of urinary incontinence: The ICIQ-UI SF versus the Incontinence severity index. Neurourol Urodyn. 2009;28(5):411-5.
2. Majaron B, Srinivas SN, Huang HL, Nelson JS. Deep coagulation of dermal collagen with repetitive Er:YAG laser irradiation. Lasers Surg Med 26; 2000: 214-222.
3. Vizintin Z, Rivera M, Fistonić I, Seracioğlu F, Guimares P, Gaviria J, Garcia V, Lukac M, Perhavec T, Merlini L. Novel Minimally Invasive VEF Er:YAG Laser Treatments in Gynecology. , J. LAHA - J. Laser Health Acad. Vol. 2012, No1.; 46-58; www.laserandhealthacademy.com.